Table 3 Typical values of the kinetic parameters in ASM3-ON

Symbols	Definitions	Typical values		Units
		10℃	20℃	
k_H	Hydrolysis rate constant	2	3	$gX_S/(gX_H \cdot d)$
K_X	Hydrolysis saturation constant	1	1	gX_S/gX_H
k_{STO}	Storage rate constant of S_S	2.5	5	$gS_S/(gX_H \cdot d)$
k_{USTO}	Storage rate constant of UAP	1.53	1.53	$gS_{UAP}/(gX_H \cdot d)$
k_{BSTO}	Storage rate constant of BAP	0.085	0.085	$gS_{BAP}/(gX_H \cdot d)$
η_{NO}	Hypoxia attenuation factor	0.6	0.6	
K_O	Saturation constant of S_O	0.2	0.2	gO_2/m^3
K_{NO}	Saturation constant of S_{NO}	0.5	0.5	$gNO_x\text{-}N/m^3$
K_S	Saturation constant of S_S	2	2	$gCOD/m^3$
K_{UAP}	Saturation constant of UAP	100	100	gS_{UAP}/m^3
K_{BAP}	Saturation constant of BAP	85	85	gS_{BAP}/m^3
K_{STO}	Saturation constant of X_{STO}	1	1	gX_{STO}/X_H
μ_H	Maximum specific growth rate of X_H	1	2	d^{-1}
K_{NH}	Saturation constant of S_{NH}	0.01	0.01	gN/m^3
K_{ALK}	Alkalinity constant	0.1	0.1	$molHCO_3^-/m^3$
$b_{H,O}$	Aerobic endogenous respiration rate of X_H	0.1	0.2	d^{-1}
$b_{H,NO}$	Anoxic endogenous respiration rate of X_H	0.05	0.1	d^{-1}
$b_{STO,O}$	Aerobic respiration rate of X_{STO}	0.1	0.2	d^{-1}
$b_{STO,NO}$	Anoxic respiration rate of X_{STO}	0.05	0.1	d^{-1}
μ_A	Maximum specific growth rate of X_A	0.35	1.0	d^{-1}
$K_{A,NH}$	Ammonia nitrogen saturation constant of X_A	1	1	gN/m^3
$K_{A,O}$	Oxygen saturation constant of X_A	0.5	0.5	gO_2/m^3
$K_{A,NO}$	Nitrate saturation constant of X_A	0.5	0.5	$gNO_x\text{-}N/m^3$
$K_{A,ALK}$	Alkalinity saturation constant of X_A	0.5	0.5	$molHCO_3^-/m^3$
$b_{A,O}$	Aerobic endogenous respiration rate of X_A	0.05	0.15	d^{-1}
$b_{A,NO}$	Anoxic endogenous respiration rate of X_A	0.02	0.05	d^{-1}
k_a	Ammoniation constant of dissolved organic nitrogen	0.08	0.04	$m^3COD/(gS_{ND} \cdot d)$

Table 4 Typical values of the stoichiometric parameters in ASM3-ON

Symbols	Definitions	Typical values	Units
f_{S_I}	Fraction of S_I hydrolysis	0	$gCOD_{S_I}/gCOD_{X_S}$
$Y_{STO,O}$	Yield coefficient of S_S aerobic storage	0.85	$gCOD_{X_{STO}}/gCOD_{S_S}$
$Y_{STO,NO}$	Yield coefficient of S_S anoxic storage	0.80	$gCOD_{X_{STO}}/gCOD_{S_S}$
$Y_{H,O}$	Yield coefficient of X_H growth on S_S	0.63	$gCOD_{X_H}/gCOD_{X_{STO}}$
$Y_{H,NO}$	Yield coefficient of X_H anoxic growth	0.54	$gCOD_{X_H}/gCOD_{X_{STO}}$
Y_A	Yield coefficient of X_A	0.24	$gCOD_{X_A}/gN_{S_{STO}}$
i_{N,S_I}	N content of S_I	0.01	$gN/gCOD_{S_I}$
i_{N,S_S}	N content of S_S	0.03	$gN/gCOD_{S_S}$
i_{N,X_I}	N content of X_I	0.02	$gN/gCOD_{X_I}$
$i_{N,UAP}$	N content of UAP	0.03	$gN/gCOD_{UAP}$
$i_{N,BAP}$	N content of BAP	0.02	$gN/gCOD_{BAP}$
i_{N,X_S}	N content of X_S	0.04	$gN/gCOD_{X_S}$
$i_{N,BM}$	N content of X_H and X_A	0.07	$gN/gCOD_{X_{H\ or\ A}}$
i_{TS,X_I}	TSS/COD in X_I	0.75	$gTSS/gCOD_{X_I}$
i_{TS,X_S}	TSS/COD in X_S	0.75	$gTSS/gCOD_{X_S}$
$i_{TS,BM}$	TSS/COD in X_H and X_A	0.90	$gTSS/gCOD_{X_{H\ or\ A}}$
$i_{TSS,TO}$	TSS/COD in X_{STO}	0.60	$gTSS/gCOD_{X_{STO}}$
$k_{UAP,O}$	Yield coefficient of UAP during X_H aerobic growth	0.12	$gCOD_{S_{UAP}}/gCOD_{X_H}$
$k_{UAP,NO}$	Yield coefficient of UAP during X_H anoxic growth	0.12	$gCOD_{S_{UAP}}/gCOD_{X_H}$
$k_{BAP,O}$	Yield coefficient of BAP during X_H aerobic endogenous metabolism	0.09	$gCOD_{S_{BAP}}/gCOD_{X_H}$
$k_{BAP,NO}$	Yield coefficient of BAP during X_H anoxic endogenous metabolism	0.09	$gCOD_{S_{BAP}}/gCOD_{X_H}$
$k_{UAPA,O}$	Yield coefficient of UAP during X_A aerobic growth	0.1	$gCOD_{S_{UAP}}/gCOD_{X_A}$
$k_{BAPA,O}$	Yield coefficient of BAP during X_A aerobic endogenous metabolism	0.09	$gCOD_{S_{BAP}}/gCOD_{X_A}$
$k_{BAPA,NO}$	Yield coefficient of BAP during X_A anoxic endogenous metabolism	0.09	$gCOD_{S_{BAP}}/gCOD_{X_A}$